REMARKS

Claims 17-18 and 46-95 are pending in the present application.

The presently claimed invention features nucleic acid molecules related to the *S. typhimurium* sspB, sspC, sspD, sspA, sspH, and stpA genes. These genes are important for mediating the uptake of *S. typhimurium* by epithelial cells. The claimed nucleic acid molecules and the proteins they encode are useful for detection of *S. typhimurium* (e.g., for diagnostic purposes) and for producing vaccines. They are also useful in mediating bacterial-mediated endocytosis (e.g., see Example 2 at pages 43-55 of the specification). The molecules can also be used to translocate a second molecule, e.g. a polypeptide, into the cytoplasm of a cell. This approach can be useful for, e.g., the induction or priming of cytotoxic lymphocytes (CTL) directed against the second molecule.

Claims 46-50, 52-56, 58-62, 64-68, 70-74, 76-80, 82-85, and 87-95 have been amended. No new matter is added by the amendments.

35 U.S.C. § 112, Second Paragraph

Claims 17-18 and 46-95 are rejected as allegedly indefinite.

Claims 46-95 and 17-18 are rejected as vague for recitation of the phrase "substantially pure" (Office Action at page 3). To expedite prosecution, applicant has amended the claims in which the term "substantially pure" appears to recite "isolated and purified," as suggested by the Examiner, to recite "isolated and purified." Claims 17, 18, 51, 57, 63, 69, 75, 69, 75, 81, and 86 do not recite the phrase "substantially pure" but depend from amended claims and thus do not require amendment.

Claims 88, 89, and 91 are rejected as being vague and unclear for the recitation of "can induce bacterial mediated endocytosis in the absence of a wild type SspC, SspD and SspA polypeptide" (Office Action at page 3). To expedite prosecution, these claims have been amended to state that bacterial mediated endocytosis can be induced when the recited nucleic acid sequence is introduced into a bacterium that lacks an SspC, SspD, or SspA polypeptide.

Applicant submits that the amendments to the claims are responsive to the rejection under 35 U.S.C. § 112, second paragraph and therefore respectfully request that the rejection be withdrawn.

35 U.S.C. § 102 (a)

Claims 17-18 and 46-95 are rejected as allegedly anticipated by Hermant et al. and Kaniga et al. Each reference is discussed separately below.

Hermant et al.

The Examiner states that the previously filed Declaration (Exhibit C submitted with the Amendment filed February 16, 2001) was insufficient to overcome the rejection of the claims as anticipated by Hermant et al. because, according to the Examiner, the Declaration "contains conclusory statements without sufficient evidentiary support." (Office Action at page 3). The Examiner provides several reasons for the rejection.

First, the Examiner states that the copy of the Declaration was not clear. In response to this, applicant has enclosed a clear copy of the Declaration (Exhibit E).

Second, the Examiner states that it is not clear whether the two sequences referred to in the Declaration are the result of (Office Action at page 4), "the sequencing of open reading frames" prior to July 8, 1995 or "the additional sequencing of the same clone." Applicant believes that the Declaration makes it clear that the submitted sequences are the result of "sequencing of the open reading frames" prior to July 8, 1995. This is clear from paragraph 2 of the Declaration which states that "the sequencing of the open reading frames produced the sequence in the attached document which was prepared prior to July 8, 1995" (see Exhibit E).

Third, the Examiner states that the submitted sequences do not indicate information about clone pVV8-1 and whether the sequences obtained from it are the same as the claimed sequences. Applicant does not understand the relevance of the Examiner's statement. Applicant is not claiming the pVV8-1 clone. He is claiming sequences that are provided in the application. Applicant does not understand why providing notebook pages containing details related to cloning and sequencing are relevant since the sequence is provided in the application. Applicant

respectfully requests that, if the rejection is maintained, the Examiner clarify the basis of this aspect of the rejection.

Finally, the Examiner requires information that the sequences have been submitted to any established database prior to the cited prior art publication date (Office Action at page 4). Without that information, the Examiner contends that the sequence submission does not provide sufficient evidence of conception of the claimed invention followed by diligence through an actual reduction to practice prior to the publication date of Hermant. Applicant is unaware of any requirement that reduction to practice with respect to a sequence be established by submission of the sequence to a database. As demonstrated by the Declaration and sequence data, applicant had, in fact, reduced the invention to practice prior to July 8, 1995. Nothing further is required to show reduction to practice. However, applicant herewith submits a copy of a printout from the Genbank database for U30491 (Exhibit F). The printout indicates that the sequence was submitted on June 28, 1995. This provides additional evidence that applicant was in possession of the claimed sequences before the publication date of Hermant.

In view of the above discussion, applicant submits that Hermant does not anticipate the present invention and therefore requests that the rejection under 35 U.S.C. § 102 (a) in view of Hermant be withdrawn.

Kaniga et al.

The Examiner states that the Declaration (Exhibit C, submitted with the Amendment filed February 16, 2001) was insufficient to overcome the rejection or the claim as anticipated by Kaniga et al. for the same reason that it was insufficient to overcome the rejection over Hermant et al.

Applicant addressed the Examiner's concerns above. In view of the above discussion, applicant submits that Kaniga et al. does not anticipate the present invention and therefore requests that the rejection under 35 U.S.C. § 102 (a) in view of Kaniga et al. be withdrawn.

CONCLUSION

Attached is a marked-up version of the changes being made by the current amendment.

Applicant submits that all claims are allowable, which action is respectfully requested. Enclosed is a $200 check for the Petition for Extension of Time fee. Please apply any other charges or credits to Deposit Account No. 06-1050, referencing attorney docket no. 00786-292002.

Respectfully submitted,

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Version with markings to show changes made

In the claims:

Claims 46-50, 52-56, 58-62, 64-68, 70-74, 76-80, 82-85, and 87-95 have been amended as follows:

17. (Reiterated) A method of inducing uptake of a bacterial cell by an epithelial cell in a mammal, comprising increasing expression of the nucleic acid molecule of claim 46 or 52 in said bacterial cell and administering said bacterial cell to said mammal.

18. (Reiterated) The method of claim 17, wherein said bacterial cell is a Salmonella cell.

46. (Amended three times) [A substantially pure] An isolated and purified nucleic acid molecule which hybridizes under conditions of hybridization in 50% formamide at 42°C and washing in 0.1 X SSC at 65°C to a nucleic acid molecule consisting of the nucleotide sequence of SEQ ID NO:1.

47. (Amended twice) [A substantially pure] An isolated and purified nucleic acid molecule comprising a nucleotide sequence encoding a polypeptide comprising the amino acid sequence of SEQ ID NO: 5.

48. (Amended twice) The [substantially pure] isolated and purified nucleic acid molecule of claim 47 comprising the nucleotide sequence of SEQ ID NO: 1.

49. (Amended twice) A vector comprising the [substantially pure] isolated and purified nucleic acid molecule of any of claims 46, 47, or 48.

50. (Amended twice) A host cell comprising the [substantially pure] isolated and purified nucleic acid molecule of any of claims 46, 47, or 48.

51. (Reiterated) A host cell comprising the vector of claim 49.

52. (Amended three times) [substantially pure]An isolated and purified nucleic acid molecule which hybridizes under conditions of hybridization in 50% formamide at 42°C and washing in 0.1 X SSC at 65°C to a nucleic acid molecule consisting of the nucleotide sequence of SEQ ID NO:2.

53. (Amended twice) [substantially pure] An isolated and purified nucleic acid molecule comprising a nucleotide sequence encoding a polypeptide comprising the amino acid sequence of SEQ ID NO:6.

54. (Amended twice) A [substantially pure] isolated and purified nucleic acid molecule comprising the nucleotide sequence of SEQ ID NO: 2.

55. (Amended twice) A vector comprising the [substantially pure] isolated and purified nucleic acid molecule of any of claims 52, 53, or 54.

56. (Amended twice) A host cell comprising the [substantially pure] isolated and purified nucleic acid molecule of any of claims 52, 53, or 54.

57. (Reiterated) A host cell comprising the vector of claim 55.

58. (Amended three times) [substantially pure] An isolated and purified nucleic acid molecule which hybridizes under conditions of hybridization in 50% formamide at 42°C and washing in 0.1 X SSC at 65°C to a nucleic acid molecule consisting of the nucleotide sequence of SEQ ID NO:3.

59. (Amended twice) [substantially pure] An isolated and purified nucleic acid molecule comprising a nucleotide sequence encoding a polypeptide comprising the amino acid sequence of SEQ ID NO:7.

60. (Amended twice) [substantially pure] An isolated and purified nucleic acid molecule [of claim 59] comprising the nucleotide sequence of SEQ ID NO: 3.

61. (Amended twice) A vector comprising the [substantially pure] isolated and purified nucleic acid molecule of any of claims 58, 59, or 60.

62. (Amended twice) A host cell comprising the [substantially pure] isolated and purified nucleic acid molecule of any of claims 58, 59, or 60.

63. (Reiterated) A host cell comprising the vector of claim 61.

64. (Amended three times) [substantially pure] An isolated and purified nucleic acid molecule which hybridizes under conditions of hybridization in 50% formamide at 42°C and washing in 0.1 X SSC at 65°C to a nucleic acid molecule consisting of the nucleotide sequence of SEQ ID NO:4.

65. (Amended twice) [substantially pure] An isolated and purified nucleic acid molecule comprising a nucleotide sequence encoding a polypeptide comprising the amino acid sequence of SEQ ID NO:8.

66. (Amended twice) The [substantially pure] isolated and purified nucleic acid molecule of claim 65 comprising the nucleotide sequence of SEQ ID NO:4.

67. (Amended twice) A vector comprising the [substantially pure] isolated and purified nucleic acid molecule of any of claims 64, 65, or 66.

68. (Amended twice) A host cell comprising the [substantially pure] isolated and purified nucleic acid molecule of any of claims 64, 65, or 66.

69. (Reiterated) A host cell comprising the vector of claim 67.

70. (Amended twice) [substantially pure] isolated and purified nucleic acid molecule which hybridizes under conditions of hybridization in 50% formamide at 42°C and washing in 0.1 X SSC at 65°C to a nucleic acid molecule consisting of the nucleotide sequence of SEQ ID NO:13.

71. (Amended twice) [substantially pure] isolated and purified nucleic acid molecule comprising a nucleotide sequence encoding a polypeptide comprising the amino acid sequence of SEQ ID NO:14.

72. (Amended twice) [substantially pure] isolated and purified nucleic acid molecule [of claim 71] comprising the nucleotide sequence of SEQ ID NO: 13.

73. (Amended twice) A vector comprising the [substantially pure] isolated and purified nucleic acid molecule of any of claims 70, 71, or 72.

74. (Amended twice) A host cell comprising the [substantially pure] isolated and purified nucleic acid molecule of any of claims 70, 71, or 72.

75. (Reiterated) A host cell comprising the vector of claim 73.

76. (Amended twice) [substantially pure] An isolated and purified nucleic acid molecule which hybridizes under conditions of hybridization in 50% formamide at 42°C and washing in 0.1 X SSC at 65°C to a nucleic acid molecule consisting of the nucleotide sequence of SEQ ID NO:10.

77. (Amended three times) [substantially pure] An isolated and purified nucleic acid molecule comprising a nucleotide sequence encoding a polypeptide comprising the amino acid sequence of SEQ ID NO: 12.

78. (Amended twice) The [substantially pure] An isolated and purified nucleic acid molecule of claim 77 comprising the nucleotide sequence of SEQ ID NO: 10.

79. (Amended twice) A vector comprising the [substantially pure] isolated and purified nucleic acid molecule of any of claims 76, 77, or 78.

80. (Amended twice) A host cell comprising the [substantially pure] isolated and purified nucleic acid molecule of any of claims 76, 77, or 78.

81. (Reiterated) A host cell comprising the vector of claim 79.

82. (Amended three times) [substantially pure] An isolated and purified nucleic acid molecule which hybridizes under conditions of hybridization in 50% formamide at 42°C and washing in 0.1 X SSC at 65°C to a nucleic acid molecule consisting of the nucleotide sequence of SEQ ID NO:15.

83. (Amended twice) [The substantially pure] An isolated and purified nucleic acid molecule comprising the nucleotide sequence of SEQ ID NO: 15.

84. (Amended twice) A vector comprising the [substantially pure] isolated and purified nucleic acid molecule of any of claims 82 or 83.

85. (Amended twice) A host cell comprising the [substantially pure] isolated and purified nucleic acid molecule of any of claims 82 or 83.

86. (Reiterated) A host cell comprising the vector of claim 84.

87. (Amended) [A substantially pure] An isolated and purified nucleic acid consisting essentially of SEQ ID NO:1.

88. (Amended) The [substantially pure] isolated and purified nucleic acid molecule of claim 52 or claim 53, wherein the polypeptide encoded by the [substantially pure] nucleic acid molecule, can induce bacterial-mediated endocytosis (BME) when introduced into a bacterium that lacks [in the absence of] a wild type SspC polypeptide.

89. (Amended) The [substantially pure] isolated and purified nucleic acid molecule of claim 58 or claim 59, wherein the polypeptide encoded by the nucleic acid molecule can induce bacterial-mediated endocytosis (BME) when introduced into a bacterium that lacks [in the absence of] a wild type SspD polypeptide.

90. (Amended) [A substantially pure] An isolated and purified nucleic acid molecule consisting essentially of SEQ ID NO:4.

91. (Amended) The [substantially pure] isolated and purified nucleic acid molecule of claim 64 or 65, wherein the polypeptide encoded by the nucleic acid molecule can induce bacterial-mediated endocytosis (BME) [in the absence of] when introduced into a bacterium that lacks a wild type SspA polypeptide.

92. (Amended) [A substantially pure] An isolated and purified nucleic acid molecule consisting essentially of SEQ ID NO:10.

93. (Amended) [A substantially pure] An isolated and purified nucleic acid molecule consisting essentially of SEQ ID NO:2

94. (Amended) [A substantially pure] An isolated and purified nucleic acid molecule consisting essentially of SEQ ID NO:3.

95. (Amended) [A substantially pure] An isolated and purified nucleic acid molecule consisting essentially of SEQ ID NO:13.